



THE

MINISTRY OF THE ENVIRONMENT

REPORT ON A WATER & WELL POLLUTION SURVEY

OF THE COMMUNITIES OF ROSSMORE AND REDNERSVILLE

(TOWNSHIP OF AMELIASBURGH)

IN THE COUNTY OF PRINCE EDWARD



SANITARY ENGINEERING BRANCH

DISTRICT ENGINEERS SECTION

1972

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OF THE COMMUNITIES OF ROSSMORE AND REDNERSVILLE
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INTRODUCTION

The purpose of this report is to summarize the results of a pollution survey conducted in the Community of Rossmore and the Community of Rednersville on July 24, 1972 by staff of the Ministry of the Environment. Facts in this report are being mainly presented to ensure that all parties are aware of the present day ground water conditions in the communities. In view of the adverse conditions confronting the residents, several suggestions have been made to alleviate these unfavourable situations.

LOCATION

The Community of Rossmore is located in the County of Prince Edward across the Bay of Quinte from the City of Belleville on Highway # 14.

The Community of Rednersville is situated on the Bay of Quinte, three and one half miles west of Rossmore.

TOPOGRAPHY AND SOIL CONDITIONS

The soil in the Rossmore area is derived from the weathering of the underlying bedrock together with deposits of morainic, marine and outwash origin. This firm type of soil belongs to the Ameliasburgh Series. Ranging in depth from one to three feet, the soil is therefore considered moderately shallow. In fact, exposures of the fine to medium-grained brownish grey calcium limestone of the

Trenton formation are frequent. The topography is slightly undulating.

Near Rednersville a large island-like tableland reaches 400 feet above sea level (154 feet above the bay) and presents a bold escarpment toward the Bay of Quinte. Again, the soil around Rednersville is of the Ameliasburgh Series.

POPULATION

There is no reliable information available in regard to the permanent population since the communities have no municipal boundaries. Reportedly, very little change has taken place over the years and that perhaps there are approximately 250 persons in Rossmore and 150 in Rednersville. In view of the known problems with water, we do not anticipate any appreciable change in the above figures unless perhaps municipal services become available.

EXISTING SERVICES

The limestone bedrock formations that directly underlie the Ameliasburgh Series soil are a poor source of potable ground water. Information gathered on the wells indicate that yields are generally less than 3 gpm and in fact several dry wells have been obtained.

Subsurface systems generally constitute the method of handling domestic waste. As mentioned previously, soil overburden in the area is very shallow thereby making conditions unfavourable towards the installation of septic tank systems. With the size of some lots, the depth of soil to bedrock, the soil type and the type of bedrock, it is obvious considerable contamination of groundwater will occur.

RESULTS OF WELL SURVEY

After conducting a house to house survey in the two communities, the following results were compiled:

COMMUNITY OF ROSSMORE

Approximate Number of Residences	100
Number of Contacts made during survey	73
Number of Wells sampled	30
Number of Samples Adverse	25 (83%)
Number of Samples Doubtful	0 (0%)
Number of Samples Satisfactory	5 (17%)

COMMUNITY OF REDNERSVILLE

Approximate Number of Residences	45
Number of Contacts made during survey	25
Number of Wells sampled	20
Number of Samples Adverse	11 (55%)
Number of Samples Doubtful	0 (0%)
Number of Samples Satisfactory	9 (45%)

Satisfactory	- total coliforms - 0
	- fecal coliforms - 0
Doubtful	- total coliforms - 1-4 per 100 ml.
	- fecal coliforms - 0
Adverse	- total coliforms - greater than 4/100 ml.
	- fecal coliforms - present

Of the five satisfactory wells in Rossmore, it is interesting to note that one of the wells had recently been treated with the application of Javex prior to the sampling and another well was not being used by the resident because of the salt content. Therefore,

in essence, the percent adverse conditions is actually higher than shown above in the table. Hydrogen sulphide, salt, and the gasoline content of water from some wells has reportedly been so high that it is unfit for domestic consumption. It is no wonder then that over 50% of the residents obtain water either from the City of Belleville or their neighbour (with a potable supply) for domestic use.

In the Community of Rednersville, conditions were somewhat better with 45% of the samples collected being satisfactory. The wells dug or drilled chiefly into bedrock generally yield sufficient supplies of water.

SURFACE WATER CONDITIONS

In both communities, there are no defined drainage courses. Runoff would of course flow towards the Bay of Quinte. No sampling was conducted in the Bay of Quinte.

PROPOSED PROJECTS

In view of the very unsatisfactory ground water conditions, various alternatives have been considered as described below to provide the residents with adequate services.

- 1) On July 31, 1970 an Order was issued by the Ontario Water Resources Commission (now Ministry of the Environment) and the Belleville/Trenton area for public water and sewage service was established. On October 27, 1971 a comprehensive presentation of the engineering reports for servicing the defined area was presented to heads of the various municipalities, including the Township of Ameliasburgh.

After a thorough study of the rates for water, the City of Belleville concluded that expansion and enlargement of their present sources of supply would be less expensive. The Town of Trenton also indirectly arrived at the same conclusion. Simply stated it is highly improbable that Lake Ontario would be a source of supply for the Quinte Water Service Area for the immediate future. Therefore, unfortunately, the Rednersville-Rossmore area will not be serviced by the scheme at this time.

- 2) After suggestions were made that perhaps Roblin Lake could be utilized as a source of water supply for Rossmore and Rednersville, our Biology Section conducted an extensive survey during the summer of 1970. They concluded that "poor water quality would be experienced frequently by domestic users unless treatment facilities for algal removal and taste and odour control are included in the plant design." Additionally, it is questioned whether the relatively warm waters of Roblin Lake would be aesthetically pleasing to the users.

A preliminary study of the lake revealed that if certain fluctuations in water level could be tolerated, there was a sufficient supply for a population of 1,000 persons.

The distance between Roblin Lake and Rednersville is approximately 3.8 miles and between Rednersville and Rossmore 3.7 miles. To construct the trunk water main between the lake and the communities would alone cost over \$900,000.

In addition would be the cost of the intake structure, treatment plant, storage, distribution mains and operating costs.

Transporting treated water from Roblin Lake to the residents in the communities appears to be an uneconomical proposal at this time.

- 3) Groundwater resources particularly in the Rossmore area are restricted to low yields. The bedrock has such poor water yielding characteristics and is so near the ground surface that developing a well for the community is highly unlikely.

In Rednersville, the prospects are somewhat better. If a municipal water works system is considered, a ground water survey should be conducted for the purpose of investigating the availability and quality of ground water.

- 4) Complete treatment plants utilizing the Bay of Quinte as the source of water supply could also conceivably be constructed. Operating such systems would be by a competent person who has completed a course in water treatment offered by the Ministry of the Environment.
- 5) Finally, as proposed by Gore & Storrie Limited, a ten inch main from the City of Belleville could be constructed across the Bay via the bridge to the Community of Rossmore.

The residents of Rossmore when interviewed expressed a willingness to participate in any program as long as a potable water supply would be assured. In view of the present situation, the

impression exhibited was that they would pay a relatively high annual charge for a municipal supply.

With respect to waste treatment, the residents of Rednersville will continue for quite some time to utilize subsurface systems. In Rossmore, again a municipal collector system with treatment at the City of Belleville waste treatment plant should be given prior consideration. The construction of a second treatment plant on the south shores of the Bay of Quinte should only be considered if the City of Belleville proposal is studied and found to be totally uneconomical.

CONCLUSIONS

The survey is believed to warrant the following conclusions:

- 1) Groundwater in the Rossmore area is severely contaminated with bacteria. The type of soil depth to bedrock and type of bedrock allow easy access of drainage from subsurface systems to the groundwater. In addition, wells constructed many years ago, i.e. dug wells with sanitary hand pumps, have improper capping thus also allowing the access of contaminants into the groundwater. Wells drilled in recent years have, however, been properly capped.
- 2) Groundwater in Rossmore generally contains considerable quantities of dissolved mineral salts and in some cases so much that it cannot be used for domestic purposes. Some wells dug or drilled into the limestone formation have encountered hydrogen sulphide. One resident reported oil compounds in his well and this was

probably caused by a spillage of an oil onto the fractured limestone bedrock.

- 3) The Trenton formation cannot be depended upon to yield sufficient groundwater for domestic use.
- 4) In the Community of Rednersville, 55% of the wells sampled were found to contain bacteria in sufficient numbers to render them unsafe for domestic use.
- 5) To construct a municipal water works system in the Community of Rednersville would be too expensive and beyond the financial capabilities of the residents. The installation of a water system would also lead logically towards a sewer system with perhaps the treated effluent being discharged to the Bay of Quinte.
- 6) To ensure that adequate water facilities are available to all residents in Rednersville, the following course of action is suggested:
 - a) The casing of older drilled wells should be checked by the residents to ensure that it is of sufficient length into the bedrock to prevent the access of contaminants into the groundwater. In addition, the upper open end of the casing should be capped adequately.
 - b) Similar action should be taken with regards to dug wells equipped with sanitary hand pumps. The coverings on the wells should be made water tight.

- c) The residents obtaining an unsatisfactory bacteriological sample should first inspect for access routes of polluting materials to the well. These access routes should be permanently removed. Following corrective measures, the supply source should be chlorinated, allowing a chlorine contact period of approximately six hours, then flushed, but not into a septic tank.
- d) If another bacteriological sample is again found to be adverse, the source should be chlorinated on a continuous basis. Small hypochlorinators can be obtained from local companies at a cost of between \$150/200.
- e) The municipality should also consider the development of several community wells that could be adequately operated to ensure a safe potable supply to the residents.
- f) Groundwater is extremely vulnerable to contamination by the introduction of domestic wastes into subsurface leaching systems which are in close proximity of wells. Therefore, some septic tank systems close to private wells should be relocated. In this regard, reference is being made to a well on one property and a subsurface system on another where there is inadequate physical separation. The health unit recommends that a septic tank not be closer than 50 feet to a drilled well and 100 feet to a dug well. Of course, these are minimum distances as greater separation is desired especially for areas with minimum overburden and fractured limestone bedrock.

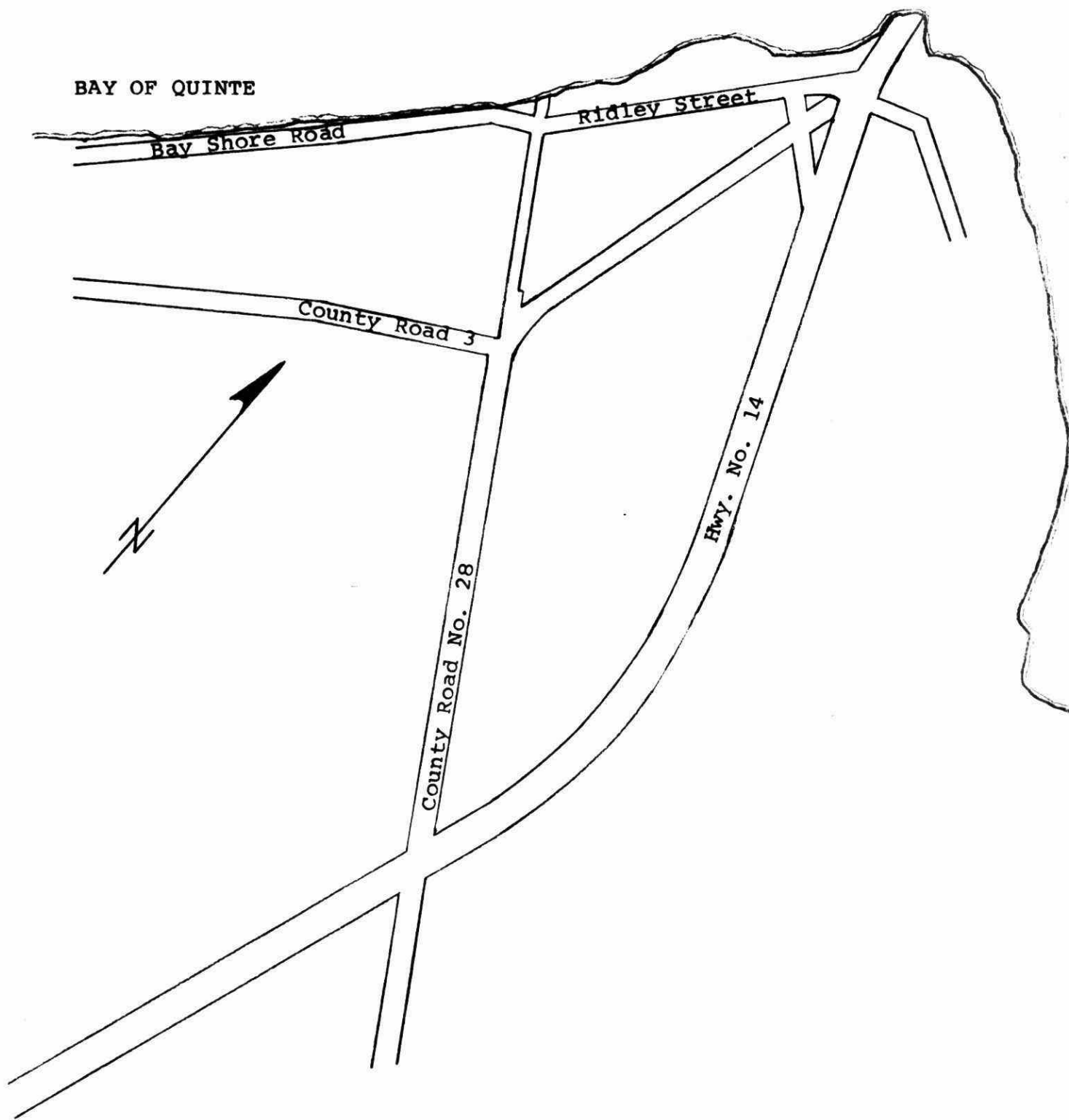
- g) Subsurface systems constructed many years ago on rock may need upgrading. The most advanced techniques will be required when constructing a system under the expected adverse soil conditions.
- 7) It is unlikely that the problems in the Community of Rossmore could be corrected on an individual basis. It is suggested that the services of a consultant be acquired to investigate the various proposals of supplying adequate municipal water and sewer services to the residents in the community. The writer believes the residents would be wholly behind such a proposal.
- 8) Any increased development in the Community of Rossmore at this time would only aggravate the present situation. The local land committee and the Planning Board should review each severance and subdivision with this in mind.

In the Community of Rednersville a certain degree of development can occur where there is adequate soil overburden.

Report prepared by: *R. A. Dunn*
R. A. Dunn, P. Eng.,
Sanitary Engineering Branch

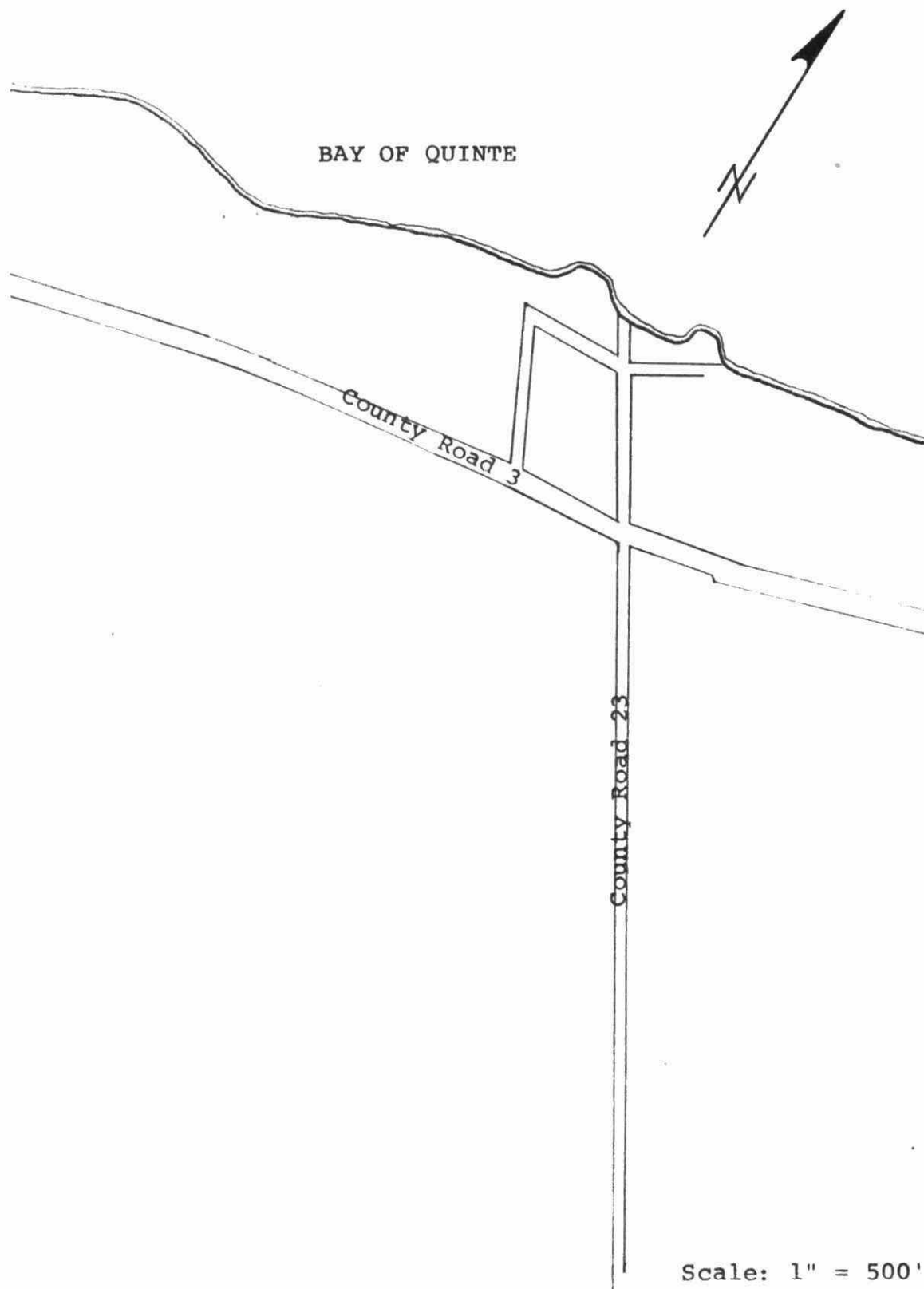
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COUNTY OF PRINCE EDWARD
COMMUNITY OF ROSSMORE



Scale: 1" = 500'

COUNTY OF PRINCE EDWARD
COMMUNITY OF REDNERSVILLE



Scale: 1" = 500'



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MINISTRY OF THE ENVIRONMENT
275 Ontario Street, Kingston, Ont. K7K 2X5 546-3171

Mr. W. Nightingale,
Clerk,
Township of Ameliasburgh,
Ameliasburgh, Ontario.

December 18 1972

Dear Mr. Nightingale:

Re: Township of Ameliasburgh
Communities of Rossmore & Rednersville
Water and Well Pollution Survey

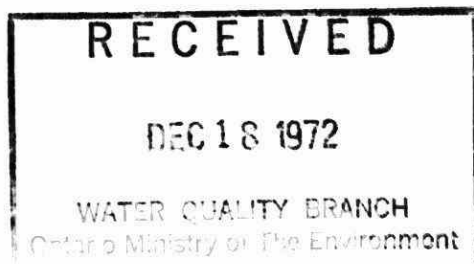
We are pleased to provide your council with a water and well survey report for the Community of Rossmore and the Community of Rednersville prepared by staff subsequent to their studies on July 24, 1972.

The investigations revealed that groundwater in the Community of Rossmore is severely contaminated with bacteria. In the Community of Rednersville conditions were somewhat better as 45% of the bacteriological samples collected were satisfactory. We have made several suggestions for each community which if implemented will no doubt alleviate the present unsatisfactory conditions. In particular, it is important to note that in the Community of Rossmore municipal water and sewage systems should be constructed. The support of the residents for such projects can be expected. For the Community of Rednersville, we have recommended that individual correction of the present systems be attempted by the residents rather than the construction of a costly water and sewage system. A course of action for individual correction is mapped out in the report.

After council has had an opportunity to review the report, we would be pleased to meet and discuss at their convenience any points which may have risen.

Yours very truly,

L. G. South, P. Eng.,
Regional Engineer,
Sanitary Engineering Branch.



RAD/lc

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OF THE COMMUNITIES OF ROSSMORE & REDNERSVILLE
(TWP. OF AMELIASBURGH)

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